PC-BASED ECG SYSTEMS

- Holter ECG
- Resting ECG
- Stress ECG
- Quality and Efficiency since 1990

LABTECH

v1.3-2012
Labtech Ltd. is an innovating, 100% Hungarian owned company established in 1990, dealing with developing and manufacturing PC-based ECG Systems.

Our products are used for monitoring and analysing the heart’s activity and its electronic signals, these are mainly ambulatory (Holter) ECGs and Resting and Stress Test ECG Systems. Our main activities are manufacturing the products and develop their analysis software, in addition to this we also maintain a sales and administration team.

Our user-friendly products are easy to wear, battery operated, made with the newest wireless up-to-date technology, building a perfect system with a Windows based computer. One of our newest developments is the Android-based product line which provides telemedicine solutions with any Android-based system such as a tablet or smartphone.

High quality and the satisfaction of our clients are guaranteed by our quality assurance certifications: ISO 9001 and ISO 13485. All our products are CE marked in line with the relevant EU Medical Devices Directive 93/42/EEC.
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The Cardiospy integrated software is the perfect solution for every type of cardiologic examination, be it a simple resting ECG examination, ambulatory blood pressure analysis or a stress test ECG examination. Its integrated database enables that all clinical data is stored and managed on the same interface, this way it increases operational efficiency and improves patient care.
All of our devices communicate using a mini USB-02 interface key with Bluetooth technology. This ensures fast PC connection, and wireless technology eliminates the inconvenience of using extra cables. Network operation is available with all our ECG systems, only one USB-02 needs to be operated in a network environment. This function increases work efficiency and it is a very cost-effective solution.
- Simple, user friendly software with various editing functions
- Fast record analysis
- Precise QRS classification and rhythm analysis
- QRS template classification
- Arrhythmia analysis, arrhythmia overview
- Colour coded graphs,
- ST level and slope analysis
- QT analysis
- Heart Rate Variability analysis (Time and frequency domain)
- Heart Rate Turbulence analysis
- Atrial Fibrillation analysis
- Microvolt T-wave alternans
- Pacemaker analysis
- BP record analysis using multiple computed parameters and graphs
- Various Holter reports
- DICOM, GDT, SCP, HL7 formats
- Local, network operation
- Export, import functions

HRV Time diagram

HRV Frequency diagram

12 Channel display
Quick-check before recording starts
As the recording starts, we can immediately check electrode-skin contact and the quality of ECG signals in the software.

ECG signal filtering to improve signal quality
Using an effective digital filtering technology, there is practically no baseline movement. The smoothing filter removes muscle and network noise components from the signals without distorting QRS complexes.

Saving time with automatic noise detection
There is no need to view or analyse the record more than once to exclude noisy channels or noisy sections from the analysis. The software automatically excludes the noisy sections, saving a significant amount of time.

Channel-selective QRS detection to reduce the number of lost intervals
Due to channel-selective QRS detection, the number of lost intervals will be reduced. In case of multichannel records the QRS detector can select one or more ECG channels for beat detection.

Effective template analysis for high precision in results
It allows a quick and effective way to check and, if need be, modify QRS types and form classifications. This solution enables a holter record to be evaluated in an average of 5-10 minutes.
With Labtech Holter ECG systems you can make 1, 2, 3 or 12 channel recordings depending on the recorder and patient cable type being used. The Cardiospy analysis software provides ECG records of excellent quality. The effective automatic evaluation and editing functions provide evaluations with nearly 100% precision in the shortest possible time. The program performs rhythm analysis, ST, QT, AF, time and frequency based HRV, and it calculates HRT and microV-TWA parameters as well. Our software is highly user-friendly: it offers a wide range of report editing and printing options, it is suitable for network usage, and provides a wide range of languages to choose from.
## Functions of Different Holter Systems

<table>
<thead>
<tr>
<th>Function</th>
<th>EC-2H</th>
<th>EC-3H</th>
<th>EC-12H</th>
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<tr>
<td>ECG Channels</td>
<td>1, 2</td>
<td>1, 2</td>
<td>1, 2</td>
</tr>
<tr>
<td>Make new record and read record to PC</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ECG Filtering</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>QRS Detection</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>HR and ST Graphs</td>
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<td>✓</td>
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<tr>
<td>Arrhythmia Analysis (N, S, V)</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Full ECG Visualization</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Event Viewer</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Colour-coded event marking</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Detailed ECG Visualization</td>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Adjustable parameters for analysis</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Report Edition</td>
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<tr>
<td>Archiving</td>
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<tr>
<td>Printing</td>
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<tr>
<td>Database</td>
<td>✓</td>
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</tr>
<tr>
<td>Interfaces – GDT, DICOM, HL-7</td>
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<tr>
<td>Editing Options:</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Measuring possibility on the ECG</td>
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<tr>
<td>Insert and delete QRS</td>
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<tr>
<td>Rename QRS</td>
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</tr>
<tr>
<td>Mark noisy intervals</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>Delete single/group events</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Motion Detection</td>
<td>✓</td>
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<tr>
<td>QRS Template Classification</td>
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<tr>
<td>QT Analysis</td>
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<tr>
<td>HRV Time Domain</td>
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<tr>
<td>HRV Frequency Domain</td>
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<tr>
<td>Pacemaker Analysis</td>
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<td>Atrial Fibrillation Analysis</td>
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<td>Vector cardiography</td>
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<td>Microvolt T-wave alternans</td>
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<td>HR Turbulence Analysis</td>
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<tr>
<td>Breathing Detection</td>
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The EC-ABP is a member of the PC based ECG Holter product family. The diagnostic device operates with rechargeable or alkaline batteries, being suitable for 48-hour BP monitoring with up to 250 BP readings, using oscillometric technology. It is a clinically validated technology in all three internationally recognized standards (BHS, ESH and ANSI). The device computes accurate and comprehensive systolic and diastolic readings, heart rate, mean arterial pressure, BP load and pulse pressure. It provides report generation, editing, and data export-import functions. The integrated software can be operated in a network environment with a common database for the entire ECG Holter product family. The software is available with a wide range of languages to choose from.
The EC-3H/ABP combines a 3-channel ECG Holter and an ambulatory blood pressure monitor. The QRS and PM can be detected with high precision, while template and rhythm analysis can be interactively modified by the user. This user-friendly software provides high-quality time- and frequency-based HRV, QT, ST, PM, ABP and AF results. The transparency and the interpretation of the results are aided by color-coded graphs and tables. The software offers a wide range of languages to choose from.
RESTING ECG SYSTEMS

RESTING ECG SOFTWARE

- **Simple, user friendly software with multiple functions**
- **Precise QRS classification**
- **Built-in expert system,**
- **Short and long resting ECG record**
- **Various printable reports,**
- **Customizable alarm criteria**
- **Comparing measurements**
- **DICOM, GDT, MFER, HL7**
- **Local and network operation**
- **Export and import functions**
- **Arrhythmia analysis, arrhythmia overview**

**Monitoring patient with continuous recording**
Besides conventional or short-term resting ECG records, you can also make records lasting several hours.

**ECG Filtering to improve signal quality**
Using an effective digital filtering technology, there is practically no baseline movement. The smoothing filter removes muscle and network noise components from the signals without distorting QRS complexes.

**Rhythm view**
All resting/continuous/stress test ECG examination will have a window below the normal 1-minute-long ECG display. This full view display shows a 5-minute-long ECG section and we can keep track of all arrhythmias in this section.

**Main Window**

**Cardiospy Lite**
PC-based resting ECGs have several advantages compared to conventional ECG systems using thermal paper:

Digital data storage
Thousands of records can be stored while taking up minimal space

Cost-efficient operation
Digital data storage and printing records on regular paper instead of expensive thermal paper saves costs

Simple patient database management
Patient databases can be conveniently viewed on a screen, no need to file through patient cards

Filters
There are several filters when searching for a patient’s record, it saves time in the administration process

Reliable data storage
The record does not fade or crinkle

Record mobility
The record can be easily copied, uploaded to a portal or sent via email

Compatibility
Records can be saved in various file formats (jpg, pdf, etc.)

Hospital information systems
Compatible with DICOM, GDT, MFER and HL7

Customizable views
A computer screen is a perfect means to display the different ECG channels, and we can also:
- switch channels on and off
- set paper speed and amplitude
- set the median’s size

Enclose doctor’s diagnosis
It is possible to add a diagnosis to the record itself

Automatic interpretation
The doctor only needs to check the automatic interpretation of the software, which makes the diagnostic process shorter and easier

To conclude, we are certain that the PC-based ECG systems of Labtech Ltd. will not disappoint you. Our top priority in engineering our software has been to create a product which is easy to use and provides valuable support to doctors in their work by all possible means.
RESTING ECG SYSTEMS

EC-12R PC-based Resting ECG System (USB / Bluetooth type)

- Small size, compact built
- Available in USB and Bluetooth design
- Simultaneous recording with 3/6/12 channels
- Custom view options on the PC monitor
- Built-in expert system to give precise diagnosis
- Enclose doctor’s diagnosis
- Alarm to detect electrode falling off
- Digital data storage
- Cost-effective printing and maintenance
- Simple patient database management
- High quality ECG recording, printing, storing, transferring options
- Compatible with hospital information systems
- Long-term recording (up to several hours)

The EC-12R, a small and lightweight product, can be operated in 3/6/12 channel modes connected to a PC. It is available in USB and Bluetooth design as well. It enables fast and high-quality ECG recording with the aid of effective baseline, noise and muscle filters. The device gives an alarm signal in case of loosened electrodes or noise. The formulation of the diagnosis is aided not only by mean ECG values and parameter tables provided, but also by the automatic expert interpretation system. It uses regular sheets of paper instead of thermal paper, providing lasting printed records as well as making printing more cost-effective. The software includes a user-friendly archiving system.
EC-12RT Resting ECG Machine

- Small size, compact built
- Easy-to-use device
- Cost-effective printing and maintenance
- Displays 3/6/12 channels on coloured TFT monitor
- Alphanumeric keyboard, hotkeys for important functions
- High resolution thermal printer on 110mm thermopaper
- Internal memory up to 500 records
- Arrhythmia mode saves paper
- Pacemaker detection
- Defibrillator protected
- PC-based ECG mode available
- High quality ECG recording, printing, storing, transferring options

The EC-12RT is a high-profile portable ECG machine with thermal printer and coloured TFT monitor. The small, lightweight and compact device is very user-friendly, its TFT display, alphanumeric keyboard and various extra functions make it easy to use. Its sophisticated filters and amplifiers ensure a top-quality ECG recording. The EC-12RT device is the perfect combination of a conventional ECG machine and PC-based solutions as it can be connected to a computer via a USB-port/USB-port, this way all patient data can be uploaded into the Cardiospy software and database.

AVERAGES REPORT WITH AUTOMATIC DIAGNOSIS
Monitoring patient with continuous recording
Besides conventional or short-term resting ECG records, you can also make records lasting several hours.

Ergometer and Treadmill database
Besides 17 ergometer and 18 treadmill built-in protocols, the software also contains Master-Step and Walking Test. All protocols have been tested.

ECG Filtering to improve signal quality
Using an effective digital filtering technology, there is practically no baseline movement. The smoothing filter removes muscle and network noise components from the signals without distorting QRS complexes.

Reducing the number of faulty readings by synchronizing BP measurements
Defining blood pressure by QRS gate method effectively reduces the number of faulty measurements. Due to the integration, there is no QRS synchronous “slip”, so even in case of high heart frequency no such problem will occur.

Emergency stop when the patient feels discomfort or dizziness during continuous monitoring
In case a patient feels discomfort or dizziness during a stress test, monitoring can be extended up to 60 minutes with ST trends and blood pressure monitoring.

Rhythm view
All resting/continuous/stress test ECG examination will have a window below the normal 1-minute-long ECG display. This full view display shows a 5-minute-long ECG section and we can keep track of all arrhythmias in this section.
The EC-12R/S ECG has all the characteristics of the EC-12R device but it can also be used for making stress test examinations without monitoring blood pressure. In this case BP measurement is made with a conventional BP meter and the results are manually entered into the software. Connected to the PC, the device displays sampling and ECG curves with high precision, automatically loads controls and monitors HR, ST, ABP, MET, etc. parameters. The user-friendly analyzing software offers efficient and reliable measurements.
The EC-12S Stress Test System has all the characteristics of our EC-12R and EC-12R/S devices, but it also offers built-in auscultation blood pressure measurement. Connected to the PC, the device display sampling and ECG curves with high precision, automatically loads controls, and monitors HR, ST, ABP, MET, etc. parameters. The user-friendly analyzing software enables efficient and reliable measurement. It is capable of exporting, importing and archiving records.
The EC-12LT Treadmill is the perfect loading device for Stress Test Systems as it is a reliable and durable machine. It can be controlled by many PC-based ECGs once it is connected to a PC. It can be used for stress test examinations and rehabilitation purposes as well. Low step-up height, safety stop-belt, side handrails, quiet operation and smooth acceleration all add to the high usability of this device.
NETECG SYSTEMS

EC-12RM AND CARDIOSPY® MOBILE FOR ANDROID

- **Real-time ECG display**
- 12-channel resting ECG
- **Supports** Android 2.x and 3.x devices
- **Portrait** and landscape display mode
- Bluetooth connection with the ECG recorder
- Sends reports in JPG or MFER format via email
- Saves records to SD card then synchronise to Cardiospy software via USB cable
- Send records to Cardiospy’s cloud application

The EC-12RM is a compact ECG device, which can forward real-time, 12 channel ECG signals to any Android device (e.g.: tablet or smartphone) via Bluetooth connection. This way the device can make excellent quality ECG records in a mobile and fast method. We can measure certain sections of the ECG and customize the on-screen display of the ECG to suit our own needs. There are several methods to forward each record: jpeg and MFER formats are both accepted in the Cardiospy cloud application.
NETECG SYSTEMS
EC-12RM AND CARDIOSPY® MOBILE FOR ANDROID

The product is ideal to use in an emergency car, because:
- The tablet is easy to use because it is small and mobile
- Wireless technology eliminates the inconvenience of using cables
- Records are easy to upload to an emergency centre where they are immediately evaluated by Cardiospy’s “cloud” application
- It immediately provides feedback on the patient’s condition
- It performs a preliminary analysis of the patient on his way to the hospital
- The patient receives the appropriate treatment sooner as patient registration takes less time
ECG SIMULATOR
SIM-02 ECG SIMULATOR

- Generates ECG signals instead of a real patient
- Useful when servicing or exhibiting ECG devices
- Simulates Holter, Resting and Stress Test ECG measurements
- Can be used with banana plugs and patent clips
- Generates normal and arrhythmic QRS forms
- Generates several Heart Rate frequencies and ECG signs
- LCD display
- Easy to use device
- Low power consumption
- Works with USB cable or rechargeable batteries
- Works up to 80 hours

A calibrated ECG patient simulator is extremely useful during the calibration processes of ECG devices. Labtech Ltd.’s device is able to simulate a lifelike, complete 24-hour long Holter-monitoring or a complex stress test examination which includes non-invasive blood pressure measurement as well. The simulator has a universal ECG connection interface and a very informative LCD display controlled by a menu-based system. These functions make the use of the device really easy and convenient.
QUALITY AND EFFICIENCY
SINCE 1990